Lamarck, Johannes Muller, Pfluger, continued to be vitalists until about the middle of the nineteenth century. Then the increasing precision of physical and chemical measurement, and the discovery that organic chemicals, supposed up to that date to be formed only within living tissues, could be synthetically produced in the laboratory from inorganic substances, began to weigh heavily against vitalism.

A little later the Darwinian theory seemed to strike a fatal blow at a last stronghold of vitalism—namely, the multitude of nice adaptations to their environment displayed by living things of all levels of complexity, long regarded as indubitable evidences of design, of the working of intelligent purpose, of mind, in the production of all living creatures. For the natural selection of Darwin's theory was very rapidly accepted not only as a factor in biological evolution, but also, by very many biologists, as the sole and sufficient factor in the genesis of all the varieties of living beings with all their wealth of adaptive structures and functions. And, in spite of the ostensible implications of the word ' selection', the whole process of organic evolution was thus made to appear as a mechanical process, one in which mind, with its intelligent striving, its purposive activity, its design, its foresight, had no role to play; unless it were merely that of a perfectly inert and helpless spectator of the drama.

The Mechanical Psychology

During the modern period the study of the

mental processes slowly took shape as a special branch of science. It might have been expected that the students of this science, the psychologists, would prove to be irreconcilable enemies of the mechanical biology. But most of